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JUNE 17, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Symbol of the Sea

See Page 382

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ASTRONOMY

From Now On: Galaxies

Gleaning of more knowledge about the Milky Way galaxy in which we live is slated for the future. The extent of space and planetary mysteries will also be probed.

By WATSON DAVIS

Twelfth in a series of glances forward in science.

➤ BILLIONS of galaxies of stars, each containing more than a billion stars like our sun, many so distant that it takes light a thousand million years to reach from them to us—that is what the universe is made of.

To see a sample of one such aggregation of blazing suns, look at the twinkling sweep of the sky on a clear, dark night. The Milky Way is our galaxy, our "universe," our stellar system. The Milky Way is a galaxy seen from the inside.

Astronomers build large and wide-sighted telescopes to explore the greatest expanses of space that the senses and minds of men can encompass. From the 200-inch Hale mirror on Palomar to the sprinkling of broad-seeing Schmidts, these are providing the clues to the most magnificent mystery of the universe—the nature of the universe itself.

This search for understanding our place in the nature of things is as old as the very early questioning of the meaning of the sun by day and the moon and the stars by night. We are not far removed—on the universe time scale—from Copernicus who deflated our egocentric confidence that the earth is the center of the solar system. Only a generation ago, some astronomers were hopefully confident that the sun was the center of the Milky Way and that the Milky Way was the whole of the universe.

Three decades ago, Dr. Harlow Shapley showed the center of our galaxy is about 30,000 years of light travel from us, and we are far off-center, in but one of the millions of "island universes."

If we were not so aware of the power of scientific method and fact, this idea would be humiliating to our human estate. It does do violence to any tendency toward master race complexes, and raises, inevitably, the suspicion that there exist other worlds than ours—although one must hasten to add there is no good evidence for such existence.

Such thoughts prove to be the fabric of philosophy and religion. But the astronomers are less concerned with the meaning of their discoveries than they are in discovering the universe. The big task is to photograph, explore and puzzle the physical relationships. Let the morals fall where they may.

Using the new improved telescopes—and the extraordinary improved photographic plates that have doubled telescopic efficiency in the past decade—is only part of the detective work of the astronomer. When the plates are ready, their meaning must be deciphered through the complex clues of modern astronomy.

Prisms are used on some telescopes to spread the star light into "rainbows" from which the nature of the star can be determined.

Two tiny black dots on photographs taken through a telescope may look exactly the same and the stars making them may be very different indeed. So the spectra of the stars made with the use of prisms are very revealing, and so are the photographic plates that are sensitive to different kinds of light, such as red light and blue light.

Once the astronomers have read the light of the stars they know a great deal about them. Some stars, by reason of the way they fluctuate in brightness in a definite rhythm or period, can have their actual candle-power determined, and by comparing their seeming brilliance with the actual brilliance, their distance away can be told. They can be used as yardsticks to tell the distance of the star clusters in which they are located.

Because of the great multitudes of stars and because new factors, like great clouds of interstellar dust that obscure parts of the sky are often discovered, the task of the astronomer is long-continued, tedious, and meticulous—although awe-inspiring and exciting. The past decades of this century have been an era of great discovery in the universe. But the future promises greater fruits in the exploration of space, time and matter.

In the years to come, as telescopes and astronomers continue their work, we can expect:

A. More knowledge about the Milky Way galaxy in which we live, determining the influence of dust clouds on our estimates of the size and the future history of the Milky Way.

B. Exploration of the extent of space, particularly the discovery as to whether the great galaxies are evenly distributed or whether they thin out or thicken up in some part of space—facts that are very vital to theories of the nature of the universe.

C. Knowledge of the planetary family, since even from distant stars we may glean some bit of knowledge about our own star, the sun, that may help us in understanding its many influences upon the earth.

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AERONAUTICS

Steam for Wind Tunnel

➤ DEVELOPMENT of a supersonic wind tunnel 10 times the size of tunnels now in use may be possible through the use of steam instead of compressed air. Such steam tunnels would be large enough to contain full scale models of pilotless planes and guided missiles.

A working model of such a supersonic tunnel has been developed at Pratt Institute in Brooklyn by senior mechanical engineering students under the direction of Maj. James R. Randolph of the engineering school faculty.

The largest compressed air supersonic tunnel now in use is at the Lewis Laboratories of the National Advisory Committee for Aeronautics at Cleveland. In that tunnel it is necessary to use small models of new weapons and planes to be tested.

Steam pressures which could be furnished by the average city steam power plant could be used in the new tunnel, according to Maj. Randolph. The small model at Pratt is connected to the Institute steam lines. A velocity of 1,360 miles per hour has been produced in this model.

Maximum velocities in supersonic steam tunnels would be produced by superheating the steam with electric heating coils, which would also produce the desired dry steam for the best experimental conditions, according to Maj. Randolph.

Although the use of steam for supersonic tunnels has been considered by other engineers, Maj. Randolph believes his is the first application of the steam principle.

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ANTHROPOLOGY

African Ape-Men Declared More Human than Ape

➤ THE South African fossil ape-men, who lived thousands of years ago and whose remains have been dug up, have a closer structural resemblance to primitive men than do any of the known anthropoid apes, Dr. W. E. Le Gros Clark of Oxford University Museum's Department of Human Anatomy, has declared.

He thus differs with Dr. S. Zuckerman, anatomist of the Birmingham University Medical School who had declared that the teeth of *Australopithecinae* showed that it resembled existing apes more closely than human types (See SNL, May 27, p. 329).

The Oxford anatomist pointed out in a report to the British scientific journal, NATURE, that many specimens of jaws and palates of *Australopithecinae* show the same human-like pattern consistently.

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NUCLEAR PHYSICS

H-Bomb Devastation

A string of hydrogen bomb explosions in the Pacific could kill all life in the U. S. Until everything is done to live peaceably with Russia, it is wrong to develop the H-bomb.

➤ A STRING of hydrogen bomb explosions off the Pacific coast could kill every living thing in the United States with radioactivity. Similarly, a string of H-bombs along the line of the iron curtain could kill every living thing 3000 miles into Russia.

This is the warning of Dr. Harrison Brown, associate professor in the Institute for Nuclear Studies at the University of Chicago and wartime A-bomb scientist.

Writing in the Phi Beta Kappa's AMERICAN SCHOLAR (Summer 1950), Dr. Brown said that the H-bomb may well be too big to be used merely for its explosive power and blast effect.

"If the bomb works at all," he said, "there may well be no upper limit (or at least a very high limit) to the size of the nuclear explosion that may be created. One might well ask, of what use is a bomb which will destroy an area greater than, say, 500 square miles by its blast effect?

"The answer is that one would not use such a weapon to destroy by blast effect," he went on. "Instead, one would utilize the radioactivity that could be produced by such an explosion and permit the westerly winds to carry it over the enemy territory."

The radioactivity of a hydrogen bomb could be greatly increased by adding material that would become radioactive to the other ingredients of the weapon.

Dr. Brown visualized a series of hydrogen bomb explosions carried out along a north-south line through Prague. The radioactivity produced by the explosions would be carried eastward by the prevailing westerly winds. "All life would be destroyed," he said, "within a strip 1,500 miles wide, extending from Leningrad to Odessa, and 3,000 miles deep, extending from Prague to the Ural Mountains.

"By the time the radioactivity passed the Urals (approximately three days), the intensity would be lower and the destruction would be less. By the time the Pacific had been crossed and the west coast of America reached, the radioactivity would not be dangerous."

Admitting that many human beings might survive such an attack by protecting themselves, Dr. Brown pointed out that animals and vegetation, without protection, within the area would be destroyed.

"Such an attack," he said, "would produce a scorched earth of an extent unprecedented in history."

Russia could use the same tactics on the United States. Hydrogen bomb explosions could be set off on a north-south line in the Pacific approximately 1,000 miles west of California.

"The radioactive dust," Dr. Brown said, "would reach California in about a day, and New York in four or five days, killing most life as it traversed the continent."

As for the more conventional uranium-plutonium bombs—so-called A bombs—it is later than we think, according to Dr. Brown.

"We can expect," he said, "that the Soviet production of bombs is being pushed forward today with all possible rapidity. Indeed, it is quite possible that by the summer of 1951 Russia may have a sufficient number of bombs of the present type to enable her to destroy completely the major cities of Western Europe, should she feel compelled to do so."

Tightening "security" will not delay Russian production of the A-bomb and development of an H-bomb.

"There can be little question that the revelations of men such as May and Fuchs aided the Russian atomic development program to some extent. But we must not fool ourselves. It is probable that the Russians, solely by asking the proper questions of nature, would have developed the bomb anyway."

Dr. Brown doubted the wisdom of President Truman's decision to go ahead with the H-bomb, in view of the enormous potentialities of the new weapon for eradicating life and what the scientist called "the many constructive alternatives" to the bomb.

In concluding his article, Dr. Brown asked whether our government has done all that can be done to determine whether or not an agreement with Russia is possible.

"Until we make a concerted effort to determine whether or not an agreement is possible," he declared, "we have no moral right to proceed with the development of this new weapon."

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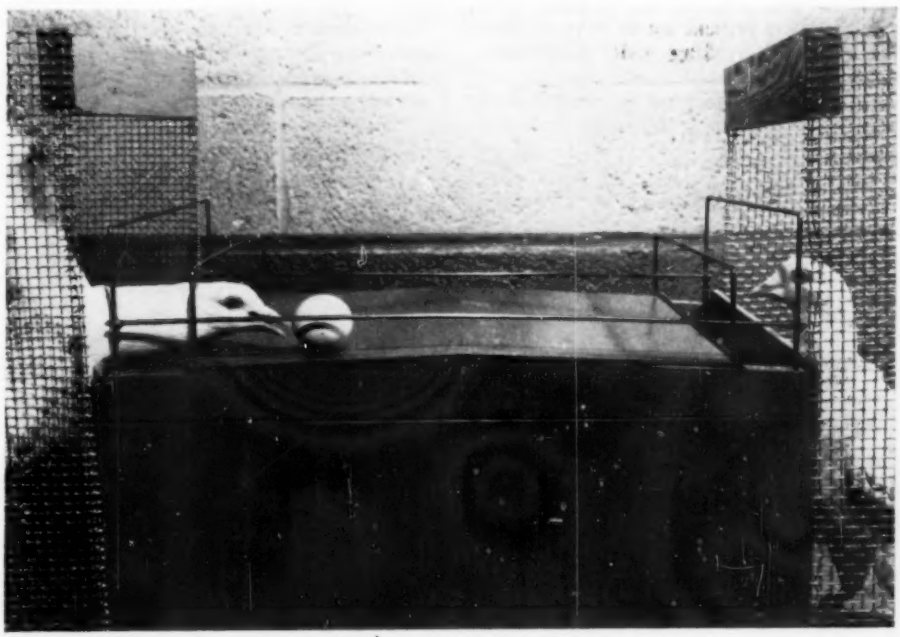
PSYCHOLOGY

Pigeons Play Ping-Pong

➤ PIGEONS at Harvard University in Cambridge, Mass., play ping-pong and peck out tunes on the piano.

The birds are not training for a vaudeville act—they are serving as laboratory animals in studies directed by Dr. B. F. Skinner. The Harvard psychologists are exploring the relative importance of reward and punishment in learning.

The table on which the birds play ping-



PIGEON PING PONG—The sports-loving pigeons engage in a lively game of ping pong. A hit is made as player A (left) bats the ball with his beak while player B watches his opponent attentively.

pong is about two feet square and slopes from the middle toward each of the opposing birds. It has no net. A ball is placed in play in the middle of the table.

As the ball rolls toward one of the birds, he bats it with his beak and tries to send it past his opponent. The other bird tries to send it back. Rallies sometimes go to three or four shots. When one bird misses, the ball rolls into a trough in front of him and his opponent receives a reward of food.

Pigeons can be taught to cooperate with each other as well as to compete. In one experiment, pigeons in separate cages with glass partition between must simultaneously peck at matching buttons to release a reward of food. When the birds work together, both eat. If they fail to cooperate, neither is fed. Result: They work together successfully.

A difficult solo task is learning to play a little piano of seven keys. The pigeons were taught to peck out simple tunes such as "Take Me Out to the Ball Game," by rewarding them when they strike the keys in the right sequence.

Prof. Skinner is the psychologist who several years ago surprised his colleagues by teaching a rat to play a marble game to get food. He says he likes pigeons better than rats as laboratory animals. They live longer and are less susceptible to disease. The lifetime of a pigeon is as long as 15 years, whereas rats live only two or three years. And pigeons have a reaction time comparable to that of humans. They also have good color vision.

The pigeons have been taught to respond to lights of different colors. When a blue light shines, the bird will peck at a sign which reads "BLUE". When the light is yellow, green or red, he will peck at the sign marked with the appropriate color.

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CHEMISTRY-AGRICULTURE

Sugar from Palm Trees

➤ A NEW use for sulfanilamide reported by an Indian scientific institute in Kanpur, India, may make the world's palm trees a future source of sugar.

It was found that the sulfa drug can prevent the sweet juices of the date, coconut, sago and brab palms from fermenting after collection from the trees.

Fresh palm juice contains 10% to 14% sucrose. Sugar cane contains 11% to 16%. The palm juice, therefore, conceivably could be a useful source of sugar. The hitch is that the juices ferment very quickly. Their present use in tropical lands is restricted to making toddy (fermented juice) or liquor.

To keep the juices from fermenting even while they are being collected, the usual practice is to add lime juice to the pots. The lime does not preserve the fresh juice; it merely slows down fermentation.

Sulfanilamide, researchers at the Indian Institute of Sugar Technology learned, can preserve the juice in fresh condition from five to 20 days. No more than .008 of an ounce per gallon of juice is required.

This finding, say the scientists, could be a valuable contribution to the food store of the world. They believe sugar made from the millions of palm trees in tropical lands is now practical.

Under present-day techniques of refining sugar, even the tiny amount of the drug used as a preservative would be left behind when the final pure sugar is produced.

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RADIO

Saturday, June 24, 3:15-3:30 p.m.

"Adventures in Science" with Mr. Watson Davis, Director of Science Service, over Columbia Broadcasting System.

Dr. Oswald Hedley, United States Health Commissioner for the Department of State, will discuss "Making Greece Healthy".

Sugar, the sweetener, is used in tanning operations to make chromic acid salts compatible with hide substances.

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MEDICINE-ENGINEERING

Chemical Stone Eradicator

A cheap chemical dissolves bladder and kidney stones and is also used as a boiler scaler. It is injected through a rubber tube into bladder or kidney.

➤ A CHEAP chemical used as a boiler scaler and in rubber, plastic and other industries may be the medicine of the future for patients with bladder and kidney stones.

So new it has so far only been used on 12 patients, it is already giving good results in dissolving even the highly insoluble calcium oxalate stones.

For his research leading to the first use of this chemical on patients, Dr. Robert F. Gehres of Sacramento, Calif., won second prize in the annual essay contest of the American Urological Association meeting in Washington.

At the same meeting, Dr. Benjamin S. Abeshouse of Baltimore reported independent experiments with the same chemical which he learned about from a green soap manufacturer.

The chemical is the tetra sodium salt of ethylene diamine tetra acetic acid. Dr. Gehres calls it calsol for short, and Dr. Abeshouse calls it by the trade name, Versene, under which the Bersworth Chemical Company of Framingham, Mass., sells it. Bersworth also markets another form of the chemical, under the tradename Calsol, for use as an oil additive. But this is not the calsol Dr. Gehres uses.

The chemical was mentioned in German scientific reports in 1937 under the name of Trilone B. Dr. Gehres working in 1947 at the J. Bentley-Squier Urological Clinic of Presbyterian Hospital-Columbia University, New York, was at first only able to get it through the Eastman Kodak Company who sold it under its long chemical name and at a high price. Later, he saw in a chemical journal an advertisement for it to be used as a boiler scaler at a low cost.

Calsol, or Versene, is only a first step toward chemical conquest of kidney and bladder stones, Dr. Gehres said. At present it must be used as an irrigating fluid injected through a rubber tube into bladder or kidney. Dr. Gehres hopes through further research and perhaps chemical modification of the compound to develop one which can either be injected into the patient's veins or taken by mouth.

In the first two patients on whom Dr. Gehres used it, the chemical failed because it was not possible to get the chemical into contact with the stone. In the third patient, the stone was reduced one-fourth of an inch in diameter in the first two days of use of calsol.

In two patients the stones were completely dissolved, one after 24 hours of continuous irrigation and the other after three days of intermittent irrigation.

Another patient for whom it was used was very sick with a stone in his only kidney. The other had been removed some years before because of tuberculosis. He could not be operated on. He got intermittent irrigations with calsol for a month during which time the stone was 50% dissolved and his kidney returned to normal function.

The best of other chemicals previously used in attempts to dissolve bladder and kidney stones is only about a third as effective as calsol. Used in the proper concentration, between one and three per cent, and with its acid-alkaline reaction adjusted to that of blood, calsol is not toxic and not irrigating.

Dr. Abeshouse has not yet tried the chemical on patients. He thinks it owes parts of its effect on insoluble stones to its action in dissolving the protein material which forms a matrix for the calcium and other alkaline earth metals in the stones. But Dr. Gehres thinks the effect is entirely due to its action on the calcium.

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SEISMOLOGY

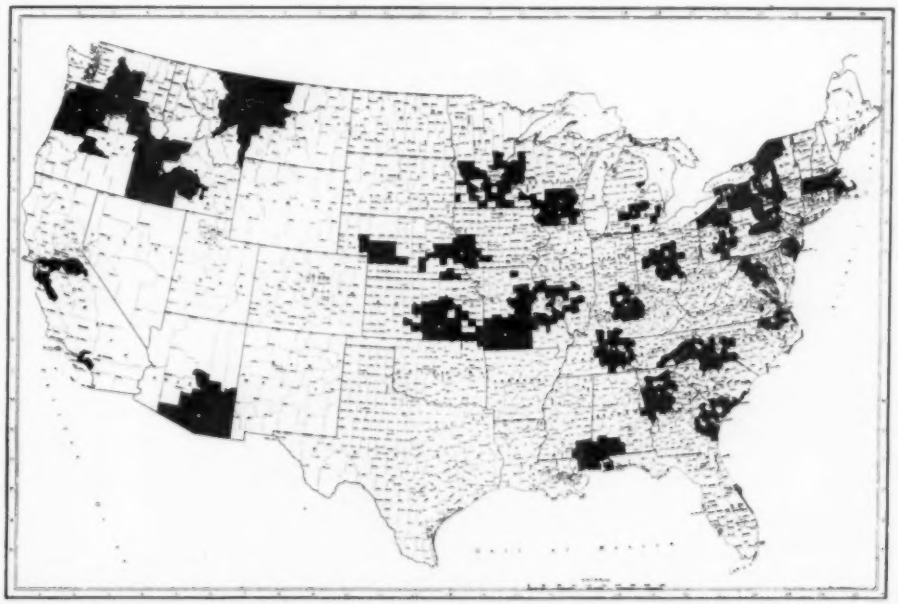
Mauna Loa Outburst Seen

➤ MAUNA Loa's present out-pouring of lava, and more lava flows from this volcano than from any other in the world, was predicted over a year ago by Dr. T. A. Jaggar. Dr. Jaggar, of the University of Hawaii, is the foremost authority on Mauna Loa and other Hawaiian volcanoes.

Unlike the eruption of Vesuvius and other famous volcanoes, the fumings of a Hawaiian volcano are usually not disastrous. Although they are spectacular and violent, they are usually not accompanied by the dangerous showers of ash, stones and hot mud that make most erupting volcanoes very hazardous. Mauna Loa is the biggest mountain in the world in total volume.

To predict eruptions, scientists use two different methods. One is a tilt measurement, made with a plumb bob suspended over a calibrated scale. When a sharp tilt is noted toward the center, it means that the volcano is falling away a bit. But when a tilt is noted outward, pressure is rising in the crater and an eruption may be forthcoming.

Seismographs which register earthquakes also tip off most eruptions of the crater. Relatively large numbers of small shocks around Mauna Loa are recorded most of the time. When these become more intense, it generally indicates that lava soon may pour forth again. On May 30 an earthquake



BLOOD CENTERS—By June 18, 1950, there will be 33 regional centers in the Red Cross Regional Blood Program serving 1,800 hospitals and 100 clinics in 38 states. Donors in approximately 1,388 communities are being reached through these regional centers and attached mobile units. Blood collected averages about 55,000 pints per month as of now.

motion was reported, probably a preliminary motion of the magma.

Between the tilt and tremor calculations, scientists can usually let the world know sometime ahead of an eruption that the big mountain will be active soon.

Mauna Loa's last eruption was in April, 1949. In 1933 and 1940 there were eruptions from the summit crater spilling lava southwest. Both times, they were followed in two years by summit eruptions which spilled lava toward the northeast.

Thus this lava flow is not following the pattern of the last two in 1935 and 1942, since it is flowing down the southwest side of the mountain.

Hilo, the only sizable city on the island, lies to the east. If necessary, the lava flow that might hit villages on the island or Hilo can be diverted by bombings which are used to break up the channels formed by the molten lava. A few relatively small bombs have diverted the flow from Hilo before.

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EDUCATION

Gifted Children Neglected

➤ THE gifted boys and girls in our schools form a minority group which is too much neglected. This is the judgment of the Educational Policies Commission, expressed in a report on "Education of the Gifted," issued in Washington.

"The country can ill afford to permit a continuation of such waste in its present proportions," the report states.

Gifted boys and girls who are in the top 10% in brightness should be prepared to go to college. The highly gifted, of whom there are only about one to each hundred in high school classes, should expect to continue their higher education beyond college graduation, the Commission believes.

At present, they report, only about one-half the gifted even go to college. This is partly because the parents cannot afford to send their bright children through high school and on to college. In many cases it is because parents do not realize just how brilliant their children are or do not appreciate the value of college education for them.

Schools and colleges have the responsibility, the Commission points out, to educate the American people to appreciate their stake in fostering the recognition, education, and utilization of human talent.

Children with outstanding talent should be spotted early in their school career and be given plenty of opportunity to develop their gifts.

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BOTANY-CHEMISTRY

Flowering Dogwood Blooms Last Six Days Longer

➤ FLOWERING dogwood that blooms four to six days longer is possible through the use of a spray containing a growth-regulator.

Another similar spray will keep the cherry blossoms on the Japanese cherry trees at the Tidal Basin in Washington from four to ten days longer, Drs. Horace V. Wester of the Department of Interior and Paul C. Marth of the Department of Agriculture report in the journal, SCIENCE (June 2).

They have tested different concentrations of alpha-naphthalene-acetic acid and para-chlorophenoxyacetic acid on the flowering dogwood. These same chemicals as well as beta-naphthaoxyacetic acid in varying concentrations were tried on the cherry blossoms.

These same three growth-regulating chemicals were used on the following plants which did not show a definite reduction in rate of petal fall: azalea, aronia, American and Asiatic crab apples, flowering almond, flowering quince, redbud, bridal wreath spirea, lilac, star magnolia and saucer magnolia.

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FORESTRY

Forest Fire Area in 1949 Equals that of Five States

➤ U. S. FOREST fires last year burned over more square miles than the combined land areas of Massachusetts, Connecticut, Rhode Island, New Jersey, Delaware and the District of Columbia.

For every nine fires in 1948, there were 10 in 1949, Lyle F. Watts, chief of the U. S. Forest Service revealed in Washington. But they were not as damaging as those the year before. Some 15,397,419 acres were burned over in 1949, as compared to 16,556,780 acres charred in 1948.

Nor were there as many fires (a total of 193,774) as the pre-war average of 210,000 forest fires a year.

The chief forester said last year's dry spells in many parts of the country and severe lightning in the West were conducive to fires. But improved smoke-eater equipment and methods, such as faster transport to the fire lines by airplanes and helicopters, kept down the spread of blazes in protected areas.

Most of 1949's fires, however, (some 83%) were on forest lands unprotected by either federal or state fire fighting agencies. The Southeast took a major share of the damage. In the 11 states that lie south of Virginia, nearly 12,000,000 unprotected acres were burned.

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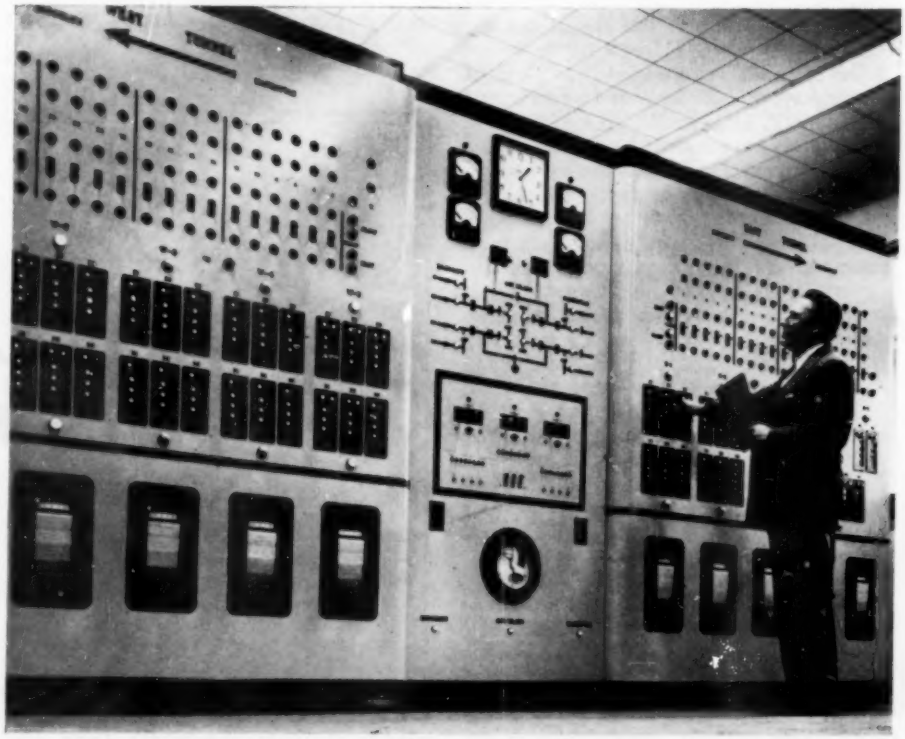

BROOKLYN BRAIN—The central brain of the new Brooklyn-Battery Tunnel's electric system controls ventilation according to carbon monoxide concentration. Carbon monoxide detector readings are continuously relayed to the control board, and flow of vehicles is regulated accordingly.

PHYSICS

Atoms for Industry

Millions of tons of atom-yielding materials await use. U. S., Russia and Sweden have the largest deposits of secondary ores, so important to industry.

➤ MILLIONS of tons of uranium and thorium are waiting in the earth's surface for the future day when splitting atoms will mean horsepower rather than horror.

Where these atomic-age minerals are, what countries have them, will be published in detail this month in one of the most comprehensive surveys of the world's atomic resources yet to appear in a U. S. scientific journal.

When industrial use of atomic energy becomes feasible, fissionable materials in thousands of tons per year will be needed, writes Dr. George W. Bain in ECONOMIC GEOLOGY (June-July 1950), bulletin of the Society of Economic Geologists. The supply may be expected to come from large low-grade ore deposits, he says.

Dr. Bain, a geology professor at Massachusetts' Amherst College, was a member both of the wartime Manhattan District atom bomb project and the post-war Baruch Committee of the Atomic Energy Commission, which drew up the U. S. plan for international atomic control.

His paper, first prepared in 1946, has waited four years for clarification of U. S. government policy on publication of uranium information. It was reviewed by AEC for security.

The over-all amount of fissionable material—uranium and thorium—in the earth is about the same as tin, Dr. Bain estimates. The theoretical difficulties in recovering it from low-grade ores, for widespread use for industrial power, should peg its value at slightly less than the cost of silver.

Thorium, because it can be converted into a fissionable variety of uranium, is potentially as important to the age of atomic power as uranium.

Uranium, Dr. Bain explains, occurs in three types of ores: pegmatites and lode veins, the richest and the rarest finds; secondary deposits, including widely-distributed bituminous shales, and marine phosphate shales and irregular carnotite-bearing sandstones, as on the Colorado Plateau; and third, nearly useless oxidized offshoots of the secondary deposits. Thorium occurs almost entirely in an ore known as monazite.

The hope for industrial atomic energy rests on the secondary deposits, Dr. Bain declares. The primary sources now being tapped for the materials of atomic warfare, he says, would soon be exhausted if hundreds or thousands of tons of uranium and thorium were needed each year.

But the secondary ores are spread over much of the earth, Dr. Bain reports. The U. S., Russia and Sweden have the largest potential supplies of these ores. Both Russia and the U. S. have over 20,000 square miles of potential carnotite area, the paper reveals.

Whenever petroleum-bearing oil shale is found, there too is apt to be uranium and thorium. Thin layers of bituminous shale are not as rich in uranium as the lode veins. But they sometimes cover hundreds of square miles, and with one-third of a pound of uranium per ton of shale, Dr. Bain says, they can be utilized.

Very large deposits of such shales are reported in the Leningrad and Ferghana regions of Russia, according to the Amherst geologist. But there are two major drawbacks to the Russian deposits: climate plus topography.

The potentially valuable low-grade deposits, Dr. Bain says, occur either in deserts where water is scarce or in bitter cold climates where the ground is frozen seven months of the year. In a milling operation where 10,000 tons of rock must be treated to yield one ton of uranium mineral, these are the most unfavorable climatic conditions possible, Dr. Bain adds.

Right now the Belgian Congo, Canada and the United States lead in production of uranium. It comes largely from primary deposits or, in this country, from Colorado's carnotite.

The Congo has produced 4,442 metric tons of uranium oxide (85% uranium), Canada has turned out 1,440 tons and the United States 1,200. Russia, Dr. Bain estimates, has produced about 72 tons.

Of thorium-rich monazite, the U. S. has produced 5,443 tons. Brazil leads the world with 72,000 tons; India is second with 45,000 tons.

Other countries which Dr. Bain describes as having uranium or thorium in greater or lesser amounts include Czechoslovakia, England (Cornwall), Portugal, Bulgaria, Madagascar, Brazil, India, Ceylon and Australia.

He lists Sweden and the Union of South Africa as potentially-important uranium areas, although no fissionable materials are produced there now.

The entire coast of Africa, Dr. Bain says, is potential monazite territory for thorium production.

Of all the areas in the world best prepared to furnish the raw materials for an atomic future, Dr. Bain cites the Witwatersrand gold area of South Africa. Uranium exists in the same ores that give gold, he says. And since these gold mines mill over 60,000,000 tons of ore each year, Dr. Bain continues, "this is the largest ready source of industrial uranium."

"If uranium and thorium are available only in limited amounts, to be guarded jealously," writes the geologist, "they may continue to be only a material of war, suitable for dealing death. . . . Industrial uranium is necessary soon if man's decision is for peace and progress."

Science News Letter, June 17, 1950

STATISTICS

June Month for Brides; In South It's December

➤ JUNE is the month for brides in some but not all sections of the country. In Mississippi, South Carolina, Arkansas and Georgia, brides prefer December, Metropolitan Life Insurance Company statisticians in New York find.

It is in the Northeastern and North Central sections of the United States that June is the most popular marriage month.

May is the month for brides in Utah, while in Nevada, there is no pronounced seasonal pattern. Young divorcees, the statisticians suggest, probably remarry shortly after the dissolution of their previous marriage, whatever the month may be.

Older brides prefer October to June for the wedding month.

Science News Letter, June 17, 1950

LAW BY AIR—Three Bell 47D1 deluxe helicopters hover in formation at the plant near Niagara Falls, New York, before heading for New York City where they were placed in service with the police department's aviation bureau. Equipped with pontoons for over-water operation, these helicopters will be used for rescue, search and traffic control.

MEDICINE

Aureomycin for Childbirth Infections

➤ AUREOMYCIN, the golden-yellow mold drug, can be used as both remedy for and preventive of childbirth infections, such as the dreaded peritonitis and childbed fever, four Johns Hopkins University, Baltimore, obstetricians and medical scientists report to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (June 10).

The four are Drs. Joseph A. Guilbeau, Jr. and Emanuel B. Schoenbach, Miss Isabelle G. Schaub and Miss Doris V. Latham.

They found that in 24 women who had normal, uncomplicated deliveries and no fever afterward, potentially dangerous microorganisms were in the wombs of three-fourths of the women three to four days after the childbirth. By contrast, in 109 women given aureomycin, microorganisms were found in the wombs of only 13 (11.9% or just over one-tenth).

Among 24 women with various childbirth infections, including four infected abortions, all but one had normal temperatures within 48 hours after aureomycin treatment was started, and many had normal temperatures in 18 and 24 hours.

Aureomycin is considered by the Baltimore group an ideal drug for preventing childbirth infections for the following reasons: It can be given by mouth, or if the patient is too nauseated by injection into the veins; it is effective against a wide variety of microorganisms; and it has minimal toxic reactions.

A further advantage is the fact that the drug reaches the unborn baby via the maternal blood stream in high enough concentration to be effective in case the unborn baby has acquired an infection such as intrauterine fetal pneumonia.

Science News Letter, June 17, 1950

NUCLEAR PHYSICS

Neutral Meson Lives One Ten-Trillionth Second

➤ THE life span of the most ephemeral subatomic particle known, the neutral meson, has been clocked at the Radiation Laboratory of the University of California.

The time is one ten-trillionth of a second.

The method for measuring the half-life of the neutral meson was developed by Dr. Herbert York. The mesons were produced by bombarding a suitable target with high-energy protons in a cyclotron. The mesons decay almost immediately into two gamma rays. Each gamma ray consists of a photon or small packet of pure radiant energy.

In passing through a sheet of lead or other heavy material the photon of energy is transformed into two particles, an electron and a positron. Since these particles are charged they can be detected in a Geiger counter.

This process is called pair production, and it can be detected by arranging two Geiger counters in a single circuit so that counts are obtained only when both counters are simultaneously activated. The first counter is set off by the positron at the same time that the second is set off by the electron.

In Dr. York's experiment the counters were arranged so that he was able to locate the source of the gamma ray causing pair production. Since the gamma ray originated in the meson decay, and since the origin and speed of the meson were known, the life of the meson could be calculated by dividing the distance traveled by the speed.

Mesons are particles associated with the forces which hold atomic nuclei together. While in the nuclei, the mesons cannot be observed. Scientists have been able to find them, however, after bombarding atomic nuclei with atomic particles from cyclotrons or other particle accelerators.

Science News Letter, June 17, 1950

INVENTION

Super-Soft Bread Stays Fresh Longer

➤ FROM the chemist's test-tube has come a new, softer loaf of bread. Made by a process just awarded a U. S. patent in Washington, this super-soft bread stays fresh longer, while an ordinary loaf turns stiff, stale and ready for crumbling.

The secret lies in the addition of a tiny amount of a complex organic compound to the ingredients in dough. A long list of such chemicals, various sorts of stearates, having this anti-stiffening effect on bread is given by the inventor, Norman F. Johnston of East Norwalk, Conn.

Why and how bread goes stale has been studied for a century. Definite answers are still not known. Nor, says Mr. Johnston in his patent, does he know exactly how his chemical ingredient slows the rate of staling. But it does. After four days, treated test loaves were only half as stiff and stale as untreated loaves.

Patent rights, for patent 2,509,926, assigned to the R. T. Vanderbilt Co. of New York, have been dedicated to the public.

Science News Letter, June 17, 1950

VETERINARY MEDICINE

White-Tailed Deer Spread Cattle Disease

➤ WHITE-TAILED deer have been spotted as helping to spread a parasitic disease that attacks cattle and sheep.

This will complicate control of the disease, the American Veterinary Medical Association said in Chicago.

The disease is a liver fluke called *Dicrocoelium dendriticum*. Unknown in the United States until about 10 years ago, it has since been found in sheep and cattle.

Science News Letter, June 17, 1950

IN SCIENCE

CHEMISTRY

Radio Waves Pasteurize Milk in Split Second

➤ ELECTRICAL apparatus for pasteurizing milk in a split-second "flash" of radio waves received patent 2,510,796 for the inventor, George H. Brown of Princeton, N.J. Rights on the device are assigned to the Radio Corporation of America.

The usual method of pasteurization is to heat milk to a temperature of 143 degrees Fahrenheit and hold that temperature for 30 minutes to kill bacteria. In the newly-patented device the milk passes in a continuous stream through a high frequency electrical field, which heats the liquid nearly to its boiling point of 212.3 degrees Fahrenheit for a fraction of a second and immediately kills germs. The milk is then cooled quickly by spraying into a vacuum chamber.

Science News Letter, June 17, 1950

CHEMISTRY

Better Chlorine Compound To Aid Dairies, Farmers

➤ A NEW form of chlorine for use as a germicide and disinfectant has been developed in Washington as a powder easily dissolved in water without leaving a toxic residue.

Expected to be of use to dairies, farms, homes and industry, it is inexpensive enough to be used for water purification and sewage decontamination.

Paul M. Gottfried, Washington bacteriologist and chemist, modified and processed an organic compound, called dactin, so that it is immediately dissolved in water to give 1600 parts per million of available chlorine in a slightly acid solution, which promotes its anti-germ qualities.

Dactin chemically is 1,3 dichloro 5,5 dimethylhydantoin, containing 66% available chlorine. The new soluble form is tradenamed Antibac-25. The residue from this compound that remains in water, after the chlorine is released, contains non-toxic acetyl urea (dimethylhydantoin), which is similar to the chemical used in some toothpastes and chewing gums.

The new material would be used by putting a small amount of it in the water used in dishwashing, cleaning milk handling equipment, bottles, etc. in restaurants, taverns, home and dairies.

Disinfection of land for turkey raising and other uses would also be possible by use of the new chlorine compound, reducing the necessity of moving turkey and other poultry flocks to different areas each year.

Science News Letter, June 17, 1950

NCE FIELDS

STATISTICS

Bad Times Drive More Old Men than Young to Suicide

➤ OLDER men are more likely to be driven to suicide when times are bad than younger men are, statisticians of the Metropolitan Life Insurance Company in New York find.

Among white men insured in the company's industrial department the percent change in the suicide rate between 1918-1920 and 1930-1932 increased progressively with each advance in age, from 10% at 20-24 years to about 100% in the broad age range 45-74 years.

Since the depression, the reductions in the suicide rate have generally been greatest within the same age group, the rates for 1947-1949 being only about half those for 1930-1932.

Women are much less affected than men by economic swings, the statisticians report. They have much lower suicide rates than men. Since the depression, older women show smaller decreases in suicide rates than younger women, although the suicide rates fell most sharply during this period among older men.

Almost one-third of the white men over 45 who committed suicide during 1947-1949 did it by hanging themselves. Almost as high a proportion used firearms and about one-eighth inhaled poisonous gas. Among the white women, however, hanging and gas each accounted for one-fourth of the suicides and poisons for nearly one-fifth of the total.

While economic difficulties play a large part in the suicides of older people, other factors such as frustration and a feeling of uselessness also play a part.

Science News Letter, June 17, 1950

ORNITHOLOGY

Ivory-Billed Woodpeckers Guarded in Hideout

➤ TWO of the rarest birds in North America are under the protective wing of the National Audubon Society.

The birds are ivory-billed woodpeckers. They are the only known members of a family which has been counted as extinct for three years.

The woodpeckers were spotted in Florida in March by an expedition organized by Whitney H. Eastman, Minneapolis business executive and amateur ornithologist. Since then the birds' exact location has been kept a carefully guarded secret. The Audubon Society says not only is the area difficult to reach, but a game warden lives on the only trail leading into the ivory-bill habitat.

Prior to Mr. Eastman's discovery, no ivory-bills had been definitely identified since 1947. Dozens of reports of the rare birds come in to the Audubon Society each year, but all of them result from bird-watchers confusing the ivory-billed variety with the pileated woodpecker, a close cousin in appearance.

The ivory-billed woodpecker once abounded in coastal swamp forests and hardwood forests from North Carolina to Texas and up the Mississippi Valley as far north as Ohio. It was able to survive only in virgin forests where the supply of woodborers was abundant. When the hardwood forests were cut in the river bottoms where the bird originally lived, the ivory-bill began to go.

The bird is the second largest woodpecker in the world.

Science News Letter, June 17, 1950

BIOLOGY

Cells Continue to Divide Even after Animal Dies

➤ NOT until a couple of hours after death do the cells in an animal body stop dividing and actually "die", provided they have begun their dividing, "mitosis" as it is called, before the animal dies.

Experiments on mice by Dr. W. S. Bullough, zoologist at the University of Sheffield, shows that cells can complete their division, once it is started, without blood supply, and the sugar, oxygen and phosphate that are necessary in the beginning of mitosis. The dividing cells can complete their process even in an atmosphere of pure nitrogen, his study of cells from mouse ears has shown. His findings were reported in NATURE (March 25).

Science News Letter, June 17, 1950

ENGINEERING

Flying Presses Supply Maps to Front-Line Troops

➤ FLYING presses will be able to supply troops at the front with maps at the rate of 5,000 sheets an hour.

A pilot model of a new light-weight airborne offset lithographic press has been designed at the Army's Engineer Research and Development Laboratories in Fort Belvoir, Va. It is now completing initial tests prior to trials by troop units in the field.

The new press is both smaller and lighter than the "Big Chief" press used in World War II. Length is 72 inches as against 89 inches. It is 13 inches shorter, and 2,400 pounds lighter.

Military maps, charts, line and halftone work in single or multicolor (by successive printings) in hairline register are possible with the new press. The unit will handle various sizes of paper in weights ranging from nine-pound onionskin to six-ply card.

Science News Letter, June 17, 1950

PSYCHOLOGY-SURGERY

Music, As You Like It, With Your Operation

➤ "WILL you have Beethoven, Perry Como or Peter and the Wolf with your operation tomorrow?"

If you were a patient at the University of Chicago Clinics you would be asked a question like that by the anesthesiologist the night before your operation.

"Surgical sonatas" are now used at the clinics to soothe patients before and during an operation. The type of music is varied to suit the patient's age and taste as determined beforehand.

When the University's Nathan Goldblatt Memorial Hospital for cancer research opened its doors on June 15 it was the first hospital in the nation to hook up all its operating amphitheaters for recorded music. The music is audible to the patient through light-weight stethoscope-type earphones but inaudible to the surgeon. Previously music with surgery was tried experimentally at other of the clinic hospitals.

Science News Letter, June 17, 1950

VETERINARY MEDICINE

Cornell Sets up Dog Disease Laboratory

➤ VIRUS diseases, now the chief unconquered contagious diseases of man, affect also his pets and friends in the dog world. But Fido and Pooch and other canines will soon have a laboratory in Ithaca, N. Y. especially devoted to research on the contagious diseases, especially the virus ones, that afflict them.

The new laboratory, to be known as the Cornell Research Laboratory for Diseases of Dogs, will adjoin the new state-constructed isolation building on Snyder Hill where important studies have recently been started on infectious diseases of poultry and other farm animals. The laboratory is an addition to the Cornell University Veterinary College.

Science News Letter, June 17, 1950

PHYSICS

Clicks of Geiger Counters Canned

➤ THE clicks of Geiger-Muller counters can be canned and kept for future study by the busy medical scientist who needs records of radioactive tracer chemicals from more than one location in the body simultaneously.

A method of doing this with commercial wire recorders, such as are connected with telephones to get records of conversations, is reported by Dr. William B. Miller, Jr., of Emory University in Atlanta, in the journal, SCIENCE (June 9).

Science News Letter, June 17, 1950

ENGINEERING

It's All Done with Glass

From fire-rescue suits to window curtains, glass is in the limelight as one of industry's exciting materials. It scores high in fireproofness, insulation power and flexibility.

By LLOYD STOUFFER

➤ AT Wright-Patterson Air Force Base I watched a man in a white suit walk into a great pit of fire fed by 500 flaming gallons of gasoline, stroll about unconcernedly for two minutes, and emerge unscathed—the only human being ever to survive longer than a few seconds in a temperature of 2000 degrees Fahrenheit. He lived because his suit covered him from head to toe with glass—many layers of glass cloth and glass wool. The temperature inside the Air Force's fire-rescue suit (See SNL Nov. 26, 1949, p. 343) never exceeded 130 degrees.

Such dramatic proof of the usefulness of glass in its newer and more versatile forms fulfills its earlier promise: that glass would become one of industry's most exciting materials. In hundreds of new ways glass is working not only to save lives but to make our living better and more comfortable. Those qualities that make possible the Air Force rescue suit—fireproofness, tremendous insulation power, flexibility—also account for many of the new everyday applications.

Gossamer Glass for Insulation

Owens-Corning Fiberglas Corporation makes silky yarn of glass in continuous filaments so fine that a single ball of glass the size of a marble will produce a filament 97 miles long. These gossamer-fine glass fibers in wool-batt form provide the most effective heat-and-cold insulation known to man. Such insulation—several layers of fluffy glass wool, interspersed with glass cloth and reflective silver and aluminum foil—is increasing the efficiency and reducing the bulk of practically every refrigerator and range built today. Owens-Corning has a convincing demonstration of this. An unbaked pie is placed in the hot oven of a Fiberglas-insulated range, along with a carton of ice cream wrapped in a batt of the same insulation. At the same time a pot of hot coffee, similarly wrapped, is placed in a Fiberglas-insulated refrigerator. Half an hour later the pie is taken out baked, the ice cream comes out still frozen hard, and the coffee, removed from the refrigerator, is poured steaming into a cup.

In many stores throughout the country, glass cloth may be purchased in the form of sheer marquisette window curtains that will not catch fire, shrink, stretch, sag or wrinkle; they are unharmed by sun, mildew or rain and never need starching or ironing; they can be taken down, washed and rehung in about seven minutes and cost about the same as the finest cotton curtains.

Until a year ago glass curtains were stiff and boardy; the fabric tended to break. Now, a heat-and-chemical crimping process called Coronizing, gives the curtains vastly improved strength and a quality called "hand"; they are soft and springy and drape beautifully. Such curtains have a life of at least 20 machine washings (and require washing only one third as often as cotton).

They reduce care to a fantastic minimum. I saw a demonstrator squirt a fountain pen on a pair of ruffled Fiberglas curtains, take them down and sweep the floor with them, dunk them briefly in a bowl of lukewarm water containing a pinch of detergent, blot them dry by rolling them in a bath towel and hang them again, clean and crisp—all in less than five minutes. In a year's test by the Columbia-Presbyterian Medical Center in New York the actual saving in maintenance was about 56% because hospital rooms were prepared for new occupants at record speed—the curtains were simply rinsed in the handbasin and rehung immediately.

A springy new insulating material called Aerocor is 99% air entrapped in a superfine glass wool lightly bonded into blanket form by a plastic resin. If you bought a storm coat or a good-quality child's snow suit last winter, it is probably interlined with the same material; you might mistake it for lamb's wool.

Glass Takes to Ball Field

Because glass in fabric form does not absorb water, most major-league baseball clubs now protect their fields with huge tarpaulins made of vinyl-coated, lightweight glass cloth instead of canvas. During a crucial New York Yankees-Cleveland Indians game last year a heavy shower came up in the second inning. A glass tarpaulin was quickly rolled out to cover the entire Cleveland infield. The shower passed, the tarpaulin was rolled up, and the game resumed. Six times, in all, that rainy day, the glass tarpaulin was used, with no noticeable increase in its weight. A canvas cover could have been rolled out only twice before becoming so waterlogged and heavy that it could not be rolled up again that day. Thus the glass tarpaulin, by making

ICE CREAM, OVEN-BAKED—The cherry pie is baked, but the ice cream is still hard after exposure to heat of 400 degrees Fahrenheit for 30 minutes in the oven of the household range because the ice cream was protected by a blanket of Fiberglas wool insulation. The range, like many other home appliances, is insulated with Fiberglas wool.

EFFORTLESS LAUNDRY — Sheer glass curtains involve a minimum of fuss and bother in their seven-minute suds-rinse-dry-and rehang routine. The truly glass curtains do not shrink or stretch, cannot burn, will not rot and require no ironing.

possible continued play and invalidating 75,000 rainchecks saved the Cleveland management close to $100,000.

Glass Conducts Electricity

At Corning Glass Works they showed me glass that conducts electricity. A 100-watt light bulb, touched to the top of a two-foot-high clear glass vase, lit and burned brightly, although there was no visible connection between the bulb and the wire attached to the foot of the vase. An incredibly thin and completely transparent film of tin oxide—only 16 one millionths of an inch thick—when applied to such glass is capable of conducting 6,000 watts per square foot. Invisibly coated on the bottom of a glass percolator soon to be marketed, it serves as a resistance heater producing a temperature of some 500 degrees Fahrenheit in a few seconds. Corning calls the new glass "E-C" for electrical-conducting.

The E-C percolator comes with a black plastic base, to be connected with ordinary house current. When the percolator is placed on the base, three metal spring buttons are depressed, contact is made, current flows through the glass and the coffee perks in less than a minute.

Libbey-Owens-Ford has a similar electrically conductive glass which it calls Electropane. It can be thermostatically controlled and is already widely used as a self deicing window for airplanes, locomotives and ships. So far the ordinary automotive electrical system does not provide a sufficiently high voltage but it is a distinct possibility for the higher-powered school buses, police cars and ambulances.

Another interesting development is photosensitive glass, containing chemicals which permanently record any picture when a negative is placed over the glass and exposed to ultraviolet light. Since these microscopic chemical particles are dispersed all through the glass, the picture is actually inside and a part of the glass. Color can be dark blue or red, or a blending of the two, and a sepia tone is now under development. Once recorded, nothing—short of breakage—will affect it.

Photosensitive Glass for Industry

There is nothing complicated about the process of making these pictures. A piece of clear glass is placed in a conventional photo-printing frame behind the negative and hung for 20 minutes in front of an ultraviolet lamp. After exposure, the glass is "developed" in sharp blue tones, by placing it for 40 minutes in an electric furnace at 1,000 degrees Fahrenheit. Longer exposure would produce a red picture.

Of particular interest are the industrial applications of the photographic process. It was discovered at Corning that a ⅛-inch sheet of photosensitive glass with a criss-cross pattern of opal white lines ingrained through its depth provides an ideal material for controlling the dispersion of light from incandescent and fluorescent fixtures. Fota-Lite glass gives an even, glareless light throughout the room—as well as direct light, channeled straight downward through the clear 1/16-inch squares, for close seeing.

The blue-green tint of the vast window areas in New York's new United Nations skyscraper represent Libbey-Owens-Ford's latest contribution to window glazing—a special glare-reducing, heat-absorbing plate glass. Two types of iron oxides—ferrous and ferric—are used in most glassmaking. Glass containing a high percentage of ferrous oxide absorbs light rays near the infrared (heat) end of the spectrum; glass with a heavy content of ferric oxide blocks light in the ultraviolet (glare) area. In the development of sun glasses and welding goggles it was found that a proper balance of the two oxides would achieve this double purpose without materially reducing beneficial light. Although the production difficulties were immense, this principle has now been carried over into the manufacture of plate glass, known as E-Z-Eye.

An E-Z-Eye car windshield appears no different from ordinary safety glass, except for the bluish-green tint—not unlike that of high-grade sunglasses. The tint is more noticeable outside than inside the car. Actual tests show that such windshields cut glare transmission 33% and eliminate about half the heat.

But of all the new fields for glass, the most prolific in exciting new consumer products is the combination of glass fibers, as reinforcement, with plastics—producing materials that are lighter than any low-cost metal, stronger than any high-tensile metal. Great strides have been made with this material since it first proved its possibilities in the Army's wartime bullet-resisting "glass" airplane and the Navy's bulletproof vest.

Glass Plus Plastic

The newest production process eliminates the expense of first weaving the glass fibers into cloth. Borrowing a method that has been used for years in the making of felt hats, loose, cut fibers are blown onto a screen formed in the approximate shape of the desired object and held there by suction. This "pre-form" is then placed in a metal mold and a gob of quick-setting, liquid polyester resin is poured on. The mold is then closed on the syrupy mass, which is formed to exact dimensions.

The resulting product, with the glass fibers running in all directions through it, has amazing strength—a quality which makes it very useful in many products, from safety helmets to suitcases. At Owens-Corning, three small trays were set bottoms up, on the floor—one of black metal, one white porcelain-enameled and one of the Fiberglas-plastic combination. Then from a four-foot height, a 12-pound shot was dropped on each in turn. The black metal tray was hopelessly dented. The porcelain tray was crushed and the coating cracked off. But when the shot hit the Fiberglas tray, it bounced back up like a rubber ball and did not leave a mark. A corrugated Fiberglas sheet barely 1/16 of an inch thick is strong enough to support a man's weight, yet can be sawed and nailed like wood.

FREIGHTERS

If you want to travel without dressing up, get "Travel Routes Around the World." It packs a wealth of information for planning trips on passenger carrying freighters to all parts of the world; tells ports they visit, length of voyage, prices; briefly describes accommodations.

Complete; has map, photos, includes all liners and 250 airplane services (from island hopping in the West Indies to round the world trips).

For complete data on the lowest cost routes, the most interesting itineraries and the most comfortable accommodations, wrap up 50c and mail for your copy of this 40,000-word directory. Harian Publications, 21 Concourse, Greenlawn, Long Island, N. Y.

STAINLESS STEEL WEIGHING DISHES

Diameter 65 mm.

Matched to 1 mg. Any one dish is a tare weight for other dishes in same set. Numbered consecutively. Specify SNL DISH.
Set of 2 ___ $1.60: Set of 10 ___ $10.00

R. P. CARGILLE

118 Liberty St. New York 6, N. Y.

In the last two years Fiberglas-plastic combinations have virtually taken over the fields of fishing rods and small boats—and last winter Fiberglas skis, so light and fast that they were not recommended for amateurs, were the talk of the skiing slopes. Glass fishing rods are said to have all the spring and casting action of fine bamboo without the disadvantages. A standard test is to bend the tip of a rod back five inches beyond the handle without breaking. If properly made, these glass rods are good for a lifetime of fishing. The Fiberglas boat has color molded in, cannot absorb water, will not rot, never needs painting or caulking, is virtually puncture-proof and weighs less than half as much as a comparable wooden craft.

Doctors are heartened by the discovery at the University of Virginia that a gown made from a fabric woven of lead-glass yarns will protect all the vulnerable parts of the body from the X-radiation which causes an incidence in radiologists of deadly leukemia eight times higher than normal. The same fabric is highly resistant to the beta radiation of atomic-fission products—a note of hope for all of us in this atomic age.

Science News Letter, June 17, 1950

MEDICINE

Conquest of Heart Ills

➤ PROGRESS is being made in the battle to conquer heart disease. Through scientific research we will find the cause of and means of preventing much heart disease.

This was the opinion of Dr. Cassius J. Van Slyke, director of the National Heart Institute of the Public Health Service, one of the country's top research scientists and medical administrators. He spoke on Adventures in Science over the Columbia Broadcasting System as the guest of Watson Davis, director of Science Service.

"Over the past 25 years," said Dr. Van Slyke, "there have been greater scientific advances in the understanding of heart disease than in all the years before."

Dr. Van Slyke explained that the National Heart Institute which was set up under a law of Congress, is working not only on the heart and circulatory system, but on interrelated organs and systems, hereditary and environmental factors, nutrition, physiology and the whole aging process.

Within the past few months, he said, nearly 500 research grants have been awarded, totaling nearly $5,500,000. And more than $6,000,000 have been awarded for construction of new laboratory facilities to 25 institutions in 16 states.

A new Clinical Center will be ready about July, 1952, Dr. Van Slyke reported, to be used by new research groups, the nuclei of which are being established now.

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AREONAUTICS

Escape Hole in Plane Can Be Cut by Explosion

➤ PASSENGER escape from burning, crashed airplanes is expected to be aided by a device developed in England that eases the job of cutting an escape hole through the walls of the plane. It utilizes a shaped-charge explosion.

As described in London by an aviation authority, a line-charge, looped into a rectangle and specially shaped to give a punch in the right direction, blows a hole in the side of the plane. The line charges are made in the form of a tube, the explosive in the center like the wire in an electric cable.

The shaped-charge can be embedded in a semicircular cover, the flat side being coated with an adhesive to give close contact. This gives the shaped-charge effect. When fired, the explosive concentrates its energy against the side of the structure, giving a cutting performance much superior to a similar round charge.

In use in a burning plane, the device is held against the side of the fuselage on the end of a long arm and fired from a distance. Passengers inside the plane would not be injured by the explosion unless they were leaning against the panel blasted out. The idea of this shaped line charge was developed for use in crash fires when it became evident that ordinary break-in tools are ineffective.

Science News Letter, June 17, 1950

ANTHROPOLOGY

Brain Pattern Clue To Human "Missing Link"

➤ NOBODY has discovered the remains of a human "missing link" yet, but when somebody does, it will be easily identified by the evidence of its brain pattern on the inside of its skull.

This is the conclusion of Dr. Cornelius J. Connolly, professor of physical anthropology at Catholic University in Washington, after the study of 538 brains from more than 50 species in the vast collection of the U. S. National Museum.

Dr. Connolly said that the skulls of the so-called ape men found in South Africa show that those creatures were definitely anthropoid rather than human.

The anthropologist, who has recently published a book based on his research, EXTERNAL MORPHOLOGY OF THE PRIMATE BRAIN, started with the brain of lemurs, lowest of the primate family and worked upward to human brains. He also studied the skulls of many prehistoric creatures which had on the insides markings left by the brain patterns.

There is a definite distinction between the brains of humans and of the most highly developed ape—the chimpanzee, he said. One of the distinctions is in the part of the brain which controls speech.

"The brain is the most important factor in distinguishing between prehistoric men and apes," he declared. "No skull has yet been found which shows an intermediate stage between the brain of the ape and that of man."

Some other anthropologists, however, would not agree with Dr. Connolly that the brain pattern is the most important factor. Some remains, although they show evidence of ape-like brains, have leg formations almost exactly like human beings, enough like them to permit the creatures to walk on their hind legs.

Science News Letter, June 17, 1950

ATOMS PLANETS & STARS
Astronomical Wall Chart
(Not A Star Map)
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VETERINARY MEDICINE

Viruses Fight Cattle Ill

➤ DEADLY disease viruses growing in tanks on living bits of skin from the tongues of cows have given scientists a new weapon in the international battle against foot-and-mouth disease.

While American cattlemen watch infected Mexican herds apprehensively, waiting to see the outcome of a three-year battle against the disease below the Rio Grande, a world-wide foot-and-mouth conference in Paris made the fight a global war.

The official report on the meeting, submitted to top administrators of the United Nations Food and Agricultural Organization, revealed:

1. Whenever a new outbreak of the virulent animal disease crops up, anywhere in the world, cable and airmail warnings will be sent to all countries in the world by the International Office of Epizootics, which sponsored the international meeting with FAO member countries.

2. Research facilities of the British government at Pirbright, England, have been designated as an international center for identification of new strains of the extremely contagious disease. A long and complicated process—it costs about $50,000 to type one strain. Three varieties of the foot-and-mouth virus are now known. Two new strains have recently appeared in Africa.

3. A long step toward improvement of vaccines has already been made. Artificial cultivation of the disease virus by a Dutch-developed method was reported to the conference by Dr. H. S. Frenkel, director of the veterinary research laboratory of the Netherlands.

Up to the present the deadly viruses needed for vaccines have been grown in live animals—an inefficient method, to say nothing of the animal's discomfort and eventual death.

Dr. Frenkel has begun growing the disease virus in stainless steel tanks, nurtured by thin slices of skin from cattle tongues obtained from a slaughterhouse next door.

The tongue tissue is kept alive and growing in the tanks. When it becomes sufficiently infected with foot-and-mouth virus, the tissue is used to make the vaccines, which are desperately needed in many parts of the world.

Delegates from 32 nations, from Australia to Yugoslavia, attended the conference in Paris May 15-20. Not present were countries behind the Iron Curtain—Russia, Poland, Czechoslovakia—although cattle herds in those countries are known to be infected by foot-and-mouth disease.

Only large areas of the world free from foot-and-mouth disease are the United States, Canada, Australia and New Zealand. Below the Rio Grande, a joint U. S.-Mexican commission has been fighting foot-and-mouth disease for more than three years, hoping to stamp it out completely on the North American continent.

A world completely free from the foot-and-mouth disease is not a dream, the report on the Paris conference pointed out. With scientific means now at hand, said the delegates, it is possible to protect countries now free from any infection, stamp out sporadic outbreaks, and even eradicate the disease in areas where it now assumes endemic proportions.

Science News Letter, June 17, 1950

CHEMISTRY

New Form of Carbon Hard Enough to Scratch Glass

➤ SCIENTISTS in Britain have developed a new form of carbon hard enough to scratch glass. The new carbon is of primary value in fields of chemistry, electricity and engineering.

"Delanium" is the name given to the new product and it is already in commercial production. Details of the manufacturing process are not revealed, but it is made directly from coal without primary carbonization to the coke, charcoal or carbon powder normally employed in existing techniques.

The new process enables strong impermeable carbon, free from cracks or fissures, to be made in a single stage. The material produced is not only hard enough to scratch glass but tough enough to greatly reduce danger from breakage in handling fragile shapes, such as long tubes.

Delanium has high thermal conductivity and has proved to be a better material for use where this property is a requirement than glass, stoneware or rubber. In the chemical field it is suitable for lining vats and retorts. In the electrical and engineering fields, it is suitable for use as electrodes, brushes for generators and motors, sealing rings for pumps and turbines, and oil-less bearings.

Manufacturer is Powell Duffryn Carbon Products Ltd., 140 Battersea Park Road, London.

Science News Letter, June 17, 1950

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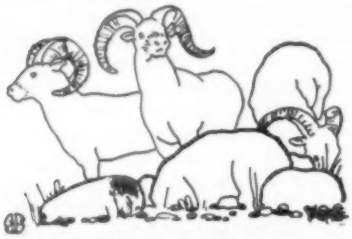
ZOOLOGY

NATURE RAMBLINGS



Mountain Sheep

➤ MOUNTAIN sheep, the native wild sheep of North America, suffer severely from what in Hollywood is a common enough occupational hazard, but which is rarely associated with the sheep family: an excess of good looks.

No panting love-sick ewe, even when the fall mating-season fever grips the flock and Pan is undisputed king, puts a higher valuation on the magnificent head of a mature ram than do certain kinds of trophy-proud, game-hunting bipeds.

The horns are broad and massive, with a bold curving sweep which starts at the forehead and turns on itself almost full circle, upwards, outwards, downwards and gently up again, so that the points are almost on a level with the eyes. This lovely downward spiral has been one of the causes of the mountain sheep's sharp numerical reduction.

Were a census of bighorns to include not only the diminishing flocks scattered throughout the Rockies from Mexico to Canada, but also the stuffed heads on sportsmen's walls, the population would doubtless come to a healthy total. But subtracting the non-productive wall trophies, the survival situation is pretty shaky.

The severe decline of the Bighorn throughout the southern half of its natural range is only partially the fault of over-hunting. Disease has taken a heavy toll. Even more drastic has been the taking over of the native habitat as pasturage for domestic sheep. Where sheep-grazing land is limited, man is sure to sponsor the interests of the money-making domestic sheep at the expense of the picturesque but uneconomic wild variety.

Except for rigidly-controlled hunting seasons in Idaho and Wyoming—where bag limits are carefully set to keep the mountain sheep population in healthy balance with local forage capacity—the animals are no longer fair game in this country. But despite severe penalties for unlawfully taking mountain sheep, a certain amount of head hunting still goes on.

Among professional wildlife managers, out-of-season, excessive or gluttonous hunting always arouses the keenest contempt, but lawless depredations committed against Bighorns seem to offend some special sentiment or passion.

An Interior Department biologist, Victor H. Cahalane, has summed up the professional attitude in these scathing words: "Whether he kills for his own trophy, or to sell the head for money, the poacher of a rare Bighorn is one of the meanest of outlaws. This human should be shot, stuffed and mounted for all to see."

Science News Letter, June 17, 1950

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PHYSICS

Fine Wire Made by New Electropolishing Process

➤ EXTREMELY fine wire for miniature electronic equipment is being made, not by the usual drawing out process, but by chemically "eating" down larger wire to the size desired. Technically, it is an electropolishing method.

Wire less than one-tenth the thickness of a human hair has been successfully made at the Armour Research Foundation of the Illinois Institute of Technology. Foundation scientists have produced wire 0.00015 inch in diameter, Dr. Howard T. Francis of the organization announced. The process is still in an experimental stage.

In the new method, wire is passed through a chemical bath in which an electric current is flowing. It becomes an electrode in an electropolishing bath and is dissolved away to the desired size.

Wire is normally made by drawing metal through successively smaller holes until a desired diameter is reached. The new process is chemical, not mechanical. Further research will determine how the method will work with various metals, and also just how fine a wire can be made and used.

Science News Letter, June 17, 1950

On This Week's Cover

➤ THE sea-horse, *Hippocampus h. hudsonius*, as shown on this week's cover of SCIENCE NEWS LETTER, long known as a symbol of marine life and surroundings, has a horse-like head. Its head is prolonged into a sort of snout, having very prominent eyes, either one of which can be rolled independently of the other. The entire body of the sea-horse is encased in a tough horny skin or skeleton which is cumbersome and makes swimming difficult, making it necessary for the animal to cling to some support lest it be carried away by even moderate currents. This the sea-horse is enabled to do by its prehensile, or grasping, tail, long considered its most singular feature by naturalists, as it is the only fish to have a prehensile tail. Its limited swimming is done by means of the dorsal fin. Indeed, as one apt description goes, if a coiled worm were attached to the base of the piece known to chess players as the knight, the sea-horse would be well imitated.

The development of this slow-moving predatory animal is unusual. The eggs are carried in the brood pouch of the male until they hatch. The male forcibly ejects its living burden when the food becomes exhausted from the membrane of the bag. However, unlike certain of the pipe-fishes (a group allied to the sea-horse), which continue to foster their young by readmittance to the paternal pouch after their ejection, the duty of the parent, when once the brood has been ejected, is at an end.

Science News Letter, June 17, 1950

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

AMERICAN LABOR UNIONS: Organization, Aims, and Power—Herbert L. Marx, Jr.—*Wilson*, 240 p., $1.75. The material presented focuses mainly on the current status of American labor unions.

ANTIHISTAMINE AGENTS IN ALLERGY—Frederick F. Yonkman, Chairman—*New York Academy of Sciences*, approx. 193 p., illus., $3.00. Technical papers presented at a conference held in October 1947, before antihistamines were being sold over-the-counter and widely discussed in connection with the common cold.

ANXIETY IN PREGNANCY AND CHILDBIRTH—Henriette R. Klein, Howard W. Potter and Ruth B. Dyk—*Hoeber*, 111 p., illus., $2.75. The results of a study made by the authors at Long Island College Hospital. For the professional man and the well-informed layman.

BOTANICAL NOMENCLATURE AND TAXONOMY: A Symposium Organized by the International Union of Biological Sciences with Support of UNESCO at Utrecht, the Netherlands, June 14-19, 1948—J. Lanjouw, Ed.—*Chronica Botanica*, 87 p., illus., paper, $2.50. Also included is the supplement to the International Rules of Botanical Nomenclature embodying the alternations made at the Sixth International Botanical Congress, Amsterdam, 1935, compiled by T. A. Sprague.

COOPERATIVE STUDIES OF THE DELAYED HARVESTING OF SWEET POTATOES—Marshall T. Deonier and others—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 841, 22 p., illus., paper, 20 cents. Recommended soil temperatures, times of harvest and methods of storage are given.

CUT AND ENGRAVED GLASS 1771-1905: The Collectors' Guide to American Wares—Dorothy Daniel—*Barrows*, 441 p., illus., $5.95. A history and guide to one of America's most skilled crafts. Beautiful black and white illustrations.

ECONOMIC MINERAL DEPOSITS—Alan M. Bateman—*Wiley*, 2nd ed., 916 p., illus., $7.50. A mineral reference book revised and edition enlarged.

FIELDBOOK OF NATURAL HISTORY—E. Laurence Palmer—*Whittlesey*, 664 p., illus., $7.00. A field guide to plants, animals, rocks, minerals and stars.

FLIGHT INTO SPACE: Great Science-Fiction Stories of Interplanetary Travel—Donald A. Wollheim, Compiler—*Fell*, 251 p., $2.75.

THE FUNDAMENTALS OF PERSONAL HYGIENE: Their Practical Application to Healthful Living—Walter W. Krueger—*Saunders*, 5th ed., 284 p., illus., $3.00. A standard text brought up-to-date.

MECHANICAL DRYING OF CORN ON THE FARM—Claude K. Shedd—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 839, 26 p., illus., paper, 10 cents.

METHODS IN CLIMATOLOGY—V. Conrad and L. W. Pollak—*Harvard University Press*, 2nd ed., 459 p., illus., $7.50. A college text revised.

NATURAL RUBBER AND YOU—*National Rubber Bureau*, 28 p., illus., paper, free upon request to publisher, 1631 K Street, N. W., Washington 6, D. C. A brief history.

NEW FORCES IN ASIA—Bruno Lasker, Ed.—*Wilson*, 237 p., $1.75. The problems of the far east are discussed by several far eastern authorities such as Vincent Sheehan, Carlos P. Romulo and E. Stanley Jones.

THE NEW INTERNATIONAL YEAR BOOK: A Compendium of the World's Progress for the Year 1949—Henry E. Vizetelly, Ed.—*Funk and Wagnalls*, 688 p., illus., $10.00.

PACHUCO: AN AMERICAN-SPANISH ARGOT AND ITS SOCIAL FUNCTIONS IN TUCSON, ARIZONA—George C. Barker—*University of Arizona*, Social Science Bull. No. 18, 38 p., paper, 60 cents. A sociological study of an argot which is a mixture of Mexican slang, colloquial Spanish and English slang.

PERSONAL AND COMMUNITY HYGIENE APPLIED—Jesse Feiring Williams and Gloyd Gage Wetherill—*Saunders*, 610 p., illus., $4.00. The authors have added seven chapters on community hygiene to the standard text PERSONAL HYGIENE APPLIED.

PREPARATION AND USE OF AUDIO-VISUAL AIDS—Kenneth B. Haas and Harry Q. Packer—*Prentice-Hall*, 2nd ed., 327 p., illus., $4.65. A discussion of the use of audio-visual aids such as television, radio, records and photographs in educational fields.

SOME RELATIONS BETWEEN CHEMISTRY AND BIOLOGY—C. N. Hinshelwood—*Blackwell* (U. S. Distributor: *Thomas*), 14 p., paper, 50 cents. The Fifty-first Robert Boyle Lecture which was delivered before the Oxford University Scientific Club on Nov. 15, 1949.

STUDIES ON THE NONMARINE MOLLUSCA OF YUCATAN—Harold W. Harry—*University of Michigan Press*, 34 p., illus., paper, 45 cents. Results of a 1948 expedition.

SYNONYMY OF ORANGE-FLESHED VARIETIES OF CARROTS—M. F. Babb, James E. Kraus and Roy Magruder—*Gov't. Printing Office*, U. S. Dept. of Ag. Circ. No. 833, 100 p., illus., paper, 30 cents. A handbook listing the different varieties, strains, and synonyms. Many valuable illustrations.

THIRTY-SECOND ANNUAL REPORT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS 1946—National Advisory Committee for Aeronautics—*Gov't. Printing Office*, 479 p., illus., $3.50. Withheld because of war-time restrictions, this report covers the fiscal year 1946 and includes technical reports Nos. 834 to 862. Contains some of the latest information on supersonics.

TRANSACTIONS OF CONFERENCE ON INDUSTRIAL WASTES: Fourteenth Annual Meeting—*Industrial Hygiene Foundation of America*, 116 p., illus., paper, $2.00. A handbook of helps on air pollution control.

YOU AND YOUR HEART—H. M. Marvin and others—*Random House*, 306 p., illus., $3.00. A non-technical explanation of the heart and circulatory system, including discussions on coronary thrombosis, arteriosclerosis, high blood pressure and rheumatic fever.

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⚙ *SQUEEZE-BOTTLE, for delivering suntan or other lotions to the body in a spray, is made of an unbreakable plastic which is flexible enough to operate by merely squeezing. The bottle will bounce harmlessly when dropped on a floor, and it has a closure that prevents any leakage.*
Science News Letter, June 17, 1950

⚙ *BRIDGE-PIER markers, which show on the radar scope of an approaching vessel, are said to delay a portion of the radar energy received, return the delayed energy to the vessel to give a distinctive mark on the scope. Ordinarily radar shows up a bridge but not the piers.*
Science News Letter, June 17, 1950

⚙ *BREAD CONTAINER, for use in the pantry or refrigerator or on the table, is made of flexible polyethylene plastic and is the correct size to hold the ordinary commercial loaf of sliced bread. It has an air- and odor-tight traycover that keeps the bread fresh and tasty.*
Science News Letter, June 17, 1950

⚙ *ALL-PLASTIC CONCERTINA for the youngster is accurately tuned in the key of C with seven plastic keys actuating 18 tuned reeds. The six keys shown in the picture play 12 notes of one and one-half octaves. A single bass key at the other end plays six notes for chord accompaniment.*
Science News Letter, June 17, 1950

⚙ *WATER CHLORINATOR, for home use, can be inserted in the water-delivery line and uses an ordinary household bleach to supply the chlorine. In the device, part of the water is diverted from the main flow to create a vacuum to draw the chlorine solution into it.*
Science News Letter, June 17, 1950

⚙ *HIGH-SPEED motion-picture camera has been developed by the U. S. Navy for recording phenomena like underwater explosions and projectile behavior. It is a 20-lens device which will take up to 2000 frames per second. A high-intensity light is used with it to take pictures in darkness.*
Science News Letter, June 17, 1950

⚙ *IMITATION CANDLE for the dining table, made of a plastic and resembling closely the long-used wax candle, uses ordinary lighter fuel to give the flame. A fuel well is concealed near the top, and a wick from it through a metal cap feeds the fuel to the flame.*
Science News Letter, June 17, 1950

⚙ *ALUMINUM CHIMNEY, for use in dwellings, has a vitreous-enamel-coated steel flue in the center enclosed by two concentric aluminum ducts. Outside air is drawn down the outer duct, to travel upward to the inner duct, cooling the steel flue.*
Science News Letter, June 17, 1950

Do You Know?

Good-quality *green peas* have bright pods, velvety to the touch.

The greatest relative *growth* of a child in any one year is the first.

A new estimate of the age of the *earth*, based on the isotopic constitution of lead-rock, is 3,350,000,000 years.

Some commercial *laundries* mark clothing with an ink which is invisible except when under ultraviolet radiation.

Careless use of a *lawn mower* about young trees on the lawn may bruise the bark and injure the tree seriously.

Foam rubber has greatly increased in usage since the war; because of its porous, air-filled structure, it is an excellent material for cushioning.

White pine *blister rust*, a destructive disease for white pines, does not pass from tree to tree but lives a part of its life cycle on currant and gooseberry bushes.

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